

Title (en)

SOFT MAGNETIC POWDER, POWDER MAGNETIC CORE, MAGNETIC ELEMENT, AND ELECTRONIC DEVICE

Title (de)

WEICHMAGNETISCHES PULVER, PULVERMAGNETKERN, MAGNETISCHES ELEMENT UND ELEKTRONISCHE VORRICHTUNG

Title (fr)

POUDRE MAGNÉTIQUE DOUCE, NOYAU MAGNÉTIQUE DE POUDRE, ÉLÉMENT MAGNÉTIQUE ET DISPOSITIF ÉLECTRONIQUE

Publication

**EP 3301689 A1 20180404 (EN)**

Application

**EP 17193445 A 20170927**

Priority

JP 2016191541 A 20160929

Abstract (en)

A soft magnetic powder has a composition represented by  $\text{Fe}_{100-a-b-c-d-e-f} \text{Cu}_a \text{Si}_b \text{B}_c \text{M}_d \text{M}'_e \text{X}_f$  (at%) (wherein M is at least one element selected from the group consisting of Nb and the like, M' is at least one element selected from the group consisting of V and the like, X is at least one element selected from the group consisting of C and the like, and a, b, c, d, e, and f are numbers that satisfy the following formulae:  $0.1 \leq a \leq 3$ ,  $0 < b \leq 30$ ,  $0 < c \leq 25$ ,  $5 \leq b+c \leq 30$ ,  $0.1 \leq d \leq 30$ ,  $0 \leq e \leq 10$ , and  $0 \leq f \leq 10$ ), wherein a crystalline structure having a particle diameter of 1 nm or more and 30 nm or less is contained in an amount of 40 vol% or more, and the oxygen content is 50 ppm or more and 700 ppm or less in terms of mass ratio.

IPC 8 full level

**B22F 1/00** (2006.01); **B22F 1/054** (2022.01); **B22F 1/08** (2022.01); **C22C 33/00** (2006.01); **C22C 33/02** (2006.01); **C22C 38/02** (2006.01); **C22C 38/06** (2006.01); **C22C 38/12** (2006.01); **C22C 38/14** (2006.01); **C22C 38/16** (2006.01); **H01F 1/153** (2006.01); **B22F 1/142** (2022.01)

CPC (source: CN EP US)

**B22F 1/054** (2022.01 - CN EP US); **B22F 1/08** (2022.01 - CN EP US); **C22C 33/003** (2013.01 - US); **C22C 33/0257** (2013.01 - US); **C22C 38/002** (2013.01 - EP US); **C22C 38/02** (2013.01 - CN EP US); **C22C 38/06** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/16** (2013.01 - CN EP US); **C22C 38/20** (2013.01 - EP US); **C22C 38/26** (2013.01 - EP US); **C22C 38/28** (2013.01 - EP US); **C22C 38/32** (2013.01 - CN EP US); **C22C 38/34** (2013.01 - EP US); **H01F 1/15308** (2013.01 - US); **H01F 1/15333** (2013.01 - CN EP US); **H01F 1/1535** (2013.01 - EP US); **H01F 27/255** (2013.01 - CN US); **H01F 27/28** (2013.01 - US); **B22F 1/142** (2022.01 - CN EP US); **B22F 9/082** (2013.01 - EP US); **B22F 2999/00** (2013.01 - EP US); **C22C 33/02** (2013.01 - EP US)

Citation (applicant)

JP 2004349585 A 20041209 - HITACHI METALS LTD

Citation (search report)

- [X] DE 4230986 A1 19930325 - HITACHI METALS LTD [JP]
- [X] EP 2128292 A1 20091202 - HITACHI METALS LTD [JP]
- [X] JP 3389972 B2 20030324
- [A] US 2016177429 A1 20160623 - URATA AKIRI [JP], et al
- [XDA] JP 2004349585 A 20041209 - HITACHI METALS LTD

Cited by

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Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

**EP 3301689 A1 20180404**; CN 107887097 A 20180406; JP 2018056363 A 20180405; JP 6750437 B2 20200902; US 2018090252 A1 20180329

DOCDB simple family (application)

**EP 17193445 A 20170927**; CN 201710891585 A 20170927; JP 2016191541 A 20160929; US 201715716933 A 20170927